CLAIMS

1. A compressor diffuser for a turbocharger, the diffuser comprising:
a diffuser housing having a gas flow path having a side wall connecting a gas inlet to a gas outlet;
a plurality of pivotally mounted diffuser vanes arranged in the flow path to control gas flow,
and a vane angle control device for adjusting the angle of each of the plurality of vanes in the flow path; the control device comprising a unison ring coupled to the plurality of vanes in such a way that rotation of the unison ring pivots each of the vanes by interaction of a cam surface with a respective cam follower.

2. A compressor diffuser according to claim 1 wherein the unison ring comprises a substantial part of the flow path side wall.

3. A compressor diffuser according to claim 2 wherein the unison ring comprises at least 60% of the flow path side wall.

4. A compressor diffuser according to claim 3 wherein the unison ring comprises at least 70% of the flow path side wall.

5. A compressor diffuser according to claim 4 wherein the unison ring comprises at least 80% of the flow path side wall.

6. A compressor diffuser according to claim 5 wherein the unison ring comprises at least 90% of the flow path side wall.

7. A compressor diffuser according to claim 1 wherein the unison ring is mounted for rotation in a recess in the diffuser housing such that the side of the unison ring exposed to the gas flow in the gas path is generally flush with the remainder of the diffuser housing making up the flow path side wall, so that the edge of the ring is not in the flow path.

8. A compressor diffuser according to claim 7 wherein the unison ring is about 2.5mm thick.

9. A compressor diffuser according to claim 1 wherein each diffuser vane comprises a leading end and a trailing end and each is pivotally mounted about a pivot point close to the leading end.

10. A compressor diffuser according to claim 1 wherein the cam follower has a generally elongate oval shape in cross section to engage the cam surface over a contact surface.

11. A compressor diffuser according to claim 1 wherein the cam follower is formed as a tab on each vane and the respective cam surfaces are formed on the unison ring.

12. A compressor diffuser according to claim 1 wherein each cam surface is formed as an internal surface of an elongate slot in the unison ring.

13. A compressor diffuser according to claim 12 wherein the slot has an arcuate form.

14. A compressor diffuser according to claim 10 wherein the elongate oval shape of the cam follower comprises a central generally rectangular region and two curved end regions.

15. A compressor diffuser according to claim 14 wherein the elongate oval shape of the cam follower further comprises a region having a trapezium cross-section formed between the rectangular region and each curved end section, so as to present at least three generally planar sides on each side of the cam follower.

16. A compressor diffuser according to claim 10 wherein the cam surface is contoured to be complementary to the engaging surface of the

cam follower so as to maximize the area of the contact surface between the cam and the cam follower.

17. A compressor diffuser according to claim 1 wherein each vane has an elongate isosceles triangle shape with the apex of the triangle forming said one end.

18. A compressor diffuser according to claim 17 wherein the angle subtended at the apex of the triangle is between about 5 degrees and 15 degrees.

19. A compressor diffuser according to claim 18 wherein the angle subtended at the apex of the triangle is about 10 degrees.

20. A compressor diffuser according to claim 1 wherein at least one side of each vane is curved.

21. A compressor diffuser according to claim 1 wherein the vane angle control device further comprises a rack and pinion driven crank shaft.

22. A compressor diffuser according to claim 21 wherein the vane angle control device further comprises a spring biased variable current solenoid.

23. A compressor diffuser according to claim 22 wherein the crank shaft is coupled to the solenoid via a cam on the crank shaft to provide direct position feedback to the solenoid.

24. A compressor diffuser according to claim 1 wherein each vane is pivotally mounted by means of a pivot pin on the vane which engages with a hole in the diffuser housing, and wherein the pivot pin and the cam follower are mounted on the same side of the vane and the pivot pin extends beyond the tab.

25. A compressor diffuser according to claim 1 wherein the tab is formed by injection moulding.

26. A compressor diffuser for a turbocharger, comprising:
a flow path connecting a gas inlet to a gas outlet defined by a diffuser wall;
a plurality of generally elongate diffuser vanes arranged in the flow path to control gas flow each having a leading end and a trailing end, and each being pivotally mounted about a pivot point close to the leading end;
a vane angle control device for adjusting the angle of each of the plurality of vanes in the flow path;
the control device comprising:
a unison ring connected to the plurality of vanes in such a way that rotation of the ring pivots each of the vanes by interaction of a cam surface with a respective cam follower which has a generally elongate oval shape in cross section to engage the cam surface over a contact surface.

27. A compressor diffuser for a turbocharger, the diffuser comprising:
a diffuser housing having a gas flow path having a side wall connecting gas inlet to a gas outlet; a plurality of pivotally mounted diffuser vanes arranged in the flow path to control gas flow, and a vane angle control device for adjusting the angle of each of the plurality of vanes in the flow path; the control device comprising a unison ring coupled to the plurality of vanes in such a way that rotation of the unison ring pivots each of the vanes, wherein the unison ring comprises a substantial part of the flow path side wall.